

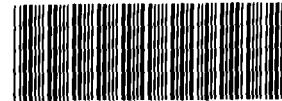
# Stoller

1 of 34

established 1959

January 11, 1994

2501-94/03



000064245

Mr Ed Mast, Project Manager  
Building 80  
EG&G Rocky Flats, Inc  
P O Box 464  
Golden, Colorado 80402-0464

RE Addendum to OU6 EE Sampling and Analysis Plan

Dear Mr Mast

Enclosed you will find a copy of the document "Phase I RFI/RI Environmental Evaluation Sampling and Analysis Plan and Field Sampling Plan -- Addendum No 1 " The document summarizes preliminary information on the ecological risk due to polychlorinated biphenyls in the sediments of the A- and B-Ponds The document also describes additional sampling that may be required to adequately address ecological risks in the Phase I RFI/RI Report

Please review and comment on the document at your earliest convenience If you have any questions or comments please do not hesitate to call

Sincerely,

Mark C Lewis, Ph D  
Project Manager

Enclosure

cc	F Harrington	EG&G
	B Bevirt	EG&G
	A Crockett	Stoller w/o enclosure
	Linda Ross	Stoller w/o enclosure

## INTEROFFICE CORRESPONDENCE

DATE February 18, 1994

TO N A Holsteen, Environmental Remediation, Bldg 080, X6987

FROM  F A Vertucci, Ecology and National Environmental Policy Act Division, X3427

SUBJECT REVIEW OF DRAFT OF ADDENDUM NO 1 ADDITIONAL POND SEDIMENT  
INVESTIGATIONS - FAV-113-94

I have read and reviewed the Draft of "Addendum No 1 Additional Pond Sediment Investigations" prepared by Dr Mark Lewis of Stoller Corporation. The first set of our comments on the earlier draft have been satisfactorily addressed in this latest draft dated February 11, 1994. I have pointed out some minor typographic errors in this latest draft to Dr Lewis. I concur with the general approach to additional pond sediment sampling and the sampling of the pond biota associated with PCB contamination outlined in the document. In my view, with these data, a defensible risk assessment can be generated describing the influence of PCB's in OU6 ecosystems. The idea we discussed of taking additional samples for rad analysis while sampling for PCB's is clearly worth doing. I will include this in the Scope of Work.

I will begin to formulate the technical sections of a Statement of Work to accomplish the necessary additional field sampling. I hope we will be able to have a meeting with the appropriate regulators and our DOE counter parts so Dr Lewis can present his strategy for the OU6 EE. I can modify the draft SOW to comply with the comments of DOE and the Regulators. I should have a draft of the SOW for your use by March 4, 1994. Please advise me as to when we can meet with the Regulators. Recall that I am unfortunately tied up in 40 hour OSHA training all next. I hope the meeting can be as soon as possible after my training.

Please let me know how I may be of further assistance.

FAV mad

Attachment  
As Stated

F A Harrington  
E C Mast  
S M Nesta  
File

January, 24 1994

TO Ed Mast, OU6 Manager

FROM Dr Frank Vertucci, END Aquatic Ecologist

RE Comments on Draft RFI/RI EE SAP/FSP Addendum No 1

A number of my comments were summarized by Bruce in his memo of January 20, 1994  
I have the additional comments listed here

#### General Comments

As I stated at our meeting this OU is exceedingly important since it holds the only known contaminant with potential ecological impacts We must do this EE well I am pleased to help toward that end

It is my view that this document should "stand alone" As it reads now one can not identify where data came from, how they were collected, when they were collected etc At least the author should provide full citation of other documents where this information can be found However, it is better to report the relevant information needed to understand the data being presented

A major flaw in the summarization of the sediment chemistry must be remedied Data are averaged for all samples when sample data should be summarized by sample site first, then sample site data can be averaged to provide estimates of average pond concentrations I have done a comparison of the two approaches to summarizing these data Data are presented in the attached Tables and Figures and show significant differences which bare on the findings of this report

#### Specific Comments

Table 1	Is incomplete, bank veg and fowl use are blank
p 7 sec 3 1 3	In general, not support littoral zones yet 1/3 of ponds have littoral veg (Table 1)
Fig 2 Table 2	Both reports improper means and standard deviations
Table 2 p2	A likely duplicate data entry SD60125WC AROCLOR-1260 is listed twice

- Fig 3 Should be redrawn with proper means and confidence intervals I have provided an example Given the sample variability the trend in concentrations from upstream to downstream is not as clear cut We know nothing about the variability in the below detection limit ponds. Considering that ponds with significant PCB levels also, at some sample locations, find no detectable PCB one wonders if the systems were sampled well enough to conclude there is no PCB in the terminal A and B series ponds I strongly believe that more intensive sampling of sediment PCBs is required
- Table 3 The origin of these data and the calculation of the endpoints listed should be described "Dominant Taxon" versus "Taxa Richness" Define taxon and taxa used. Dominant Family row lists the Class Oligochaeta.
- Page 14 Paragraph on fish is not parallel construction and logic with paragraph on herptiles One refers to pond systems the latter references the whole watershed Are there data for herptile occurrence for each pond?
- Page 15 I have a reference for bioconcentration by Pimphales minnows of 274,000x which is greater than the  $10^5$  listed in the Eisler, 1986 reference.  
— Pimphales makes a good candidate for PCB monitoring in those ponds where it is present
- Fig 4 A box for zooplankton, bacteria, and detritus could be added to make this figure more accurate
- Page 17 Table 3 is cited as containing information on mollusks and no data are presented for mollusks in Table 3 The benthos data could be better reported than by those endpoints listed in Table 3  
  
Top consumer could be predatory raptors!
- Table 4 Receptors could also include bass, minnows and raptors
- Figure 5 I think zooplankton should be added to each exposure pathway
- Page 24 Where did the organic carbon data come from? Each site, one site? Sample depth? What is the variability in sediment organic content and how does that affect the calculation of SQC values? If we have site specific data on sediment % organic content it should be used How are the SQC values calculated? Show numbers and formula Note the discrepancy between listing 19.5 ugPCB/g total organic carbon on one paragraph followed by 19.5 ugPCB/kg sediment in the next This is confusing and not reported well

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- Page 25      Top paragraph    assumption may overestimate exposure and "underestimate" the level of PCBs. Shouldn't that be overestimate levels of PCBs?
- Sec. 4.2      The section describing the sediment and water toxicity testing does not stand alone. Where are the data? What test design? How many replicates? etc etc In my view the toxicity testing done by the SWD is not scientifically sound due to lack of replication B-2 was sampled in 1991 for benthos and 1993 for sediments Given the importance of this EE for this OU these data should be derived during the same season and year otherwise interpretation is clouded at best The toxicology test data suggest that pond B-5 water is significantly toxic to *Ceriodaphnia* sp. yet this year I collected *C. reticulata* from pond B-5 with 40 individuals per liter of water.
- Section 4.3    I can't use the formula since all the data are not presented. How is the concentration in food determined from the sediment concentration of PCB? I have graphed the relationship between the sediment conc. and predicted conc. in food and don't see a clear relationship
- Define the assumptions with the rational for all model parameters (ie lognormal distribution) What is the sensitivity of the model parameters? Can you do a sensitivity analysis?
- Table 5      This analysis will need to be redone with the proper sediment chemistry concentrations
- Page 25      Last paragraph *H. asteca* .. Table 3 not 2.

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# PCB CONCENTRATION IN SEDIMENTS

9

## POND A-1

SED SITE	TOTAL PCB ALL SAMPLE	SED SITE	"TOTAL"PCB BY LOCATION	DETEC PCB BY LOCATION
60092	590	60092	670	590
60092	80	60192	410	330
60192	330	60292	540	460
60192	80	60392	410	330
60292	460	90492	400	320
60292	80			
60392	350			
60392	80			
60392	310			
60392	80			
60492	320			
90492	80			

## POND A-1

TOTAL PCB ALL SAMPLES	"TOTAL"PCB BY LOCATION
236 6667	Mean 486
51 92263	Standard Error 52 78257
195	Median 410
80	Mode 410
179 8653	Standard Deviation 118 0254
32351 52	Variance 13930
-0 7201	Kurtosis 0 220758
0 664062	Skewness 1 234966
510	Range 270
80	Minimum 400
590	Maximum 670
2840	Sum 2430
12	Count 5
Confidence Level(0 950000)	101 7665
Confidence Level(0 950000)	103 4519

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# PCB CONCENTRATION IN SEDIMENTS

## POND A-2

SED SITE	TOTAL PCB ALL SAMPLES	SED SITE	"TOTAL"PCB BY LOCATION	DETEC PCB BY LOCATION
60592	590	60592	670	590
60592	80	60692	160	0
60692	80	60792	160	0
60692	80	60892	160	0
60792	80			
60792	80			
60892	80			
60892	80			

## POND A-2

TOTAL PCB ALL SAMPLES	"TOTAL"PCB BY LOCATION
143 75	Mean
63 75	Standard Error
80	Median
80	Mode
180 3122	Standard Deviation
32512 5	Variance
8	Kurtosis
2 828427	Skewness
510	Range
80	Minimum
590	Maximum
1150	Sum
8	Count
Confidence Level(0 950000)	Confidence Level(0 950000)
124 9477	

# PCB CONCENTRATION IN SEDIMENTS

8

## POND B-1

SED SITE	TOTAL PCB ALL SAMPLES	SED SITE	"TOTAL"PCB BY LOCATION	DETEC.PCB BY LOCATION
62092	1100	62092	5505	5425
62092	9500	62192	160	U
62092	10000	62292	3520	6800 Mean
62092	80	62392	5680	5600 Standard Error
62092	80	62492	1035	955 Median
62192	80			Mode
62192	80			Standard Deviation
62292	80			Variance
62292	6800			Kurtosis
62292	80			Skewness
62292	80			Range
62392	5600			Minimum
62392	80			Maximum
62492	1000			Sum
62492	910			Count
62492	80			Confidence Level(0 950000)

## POND B-1

TOTAL PCB ALL SAMPLES	"TOTAL"PCB BY LOCATION
5425	2100 588 Mean
U	824 8318 Standard Error
6800 Mean	80 Median
5600 Standard Error	80 Mode
955 Median	3499 465 Standard Deviation
Mode	1 22E+07 Variance
Standard Deviation	1 019015 Kurtosis
Variance	1 583717 Skewness
Kurtosis	9920 Range
Skewness	80 Minimum
Range	10000 Maximum
Minimum	35710 Sum
Maximum	17 Count
Sum	Confidence Level(0 950000)
Count	1663 51
Confidence Level(0 950000)	2212 792

3180  
1128 996  
3520  
NA  
2524 512  
6373163  
-2 68674  
-0 23775  
5520  
160  
5680  
15900  
5

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# PCB CONCENTRATION IN SEDIMENTS

## POND B-2

SED SITE	TOTAL PCB ALL SAMPLES	SED SITE	"TOTAL"PCB BY LOCATION	DETEC.PCB BY LOCATION	TOTAL PCB ALL SAMPLES	"TOTAL"PCB BY LOCATION
62592	3300	62592	3380	3300		
62592	80	62692	480	400		
62692	400	62792	600	520		
62692	80	62892	6680	6600		
62792	520	62992	160	0		
62792	80			Mean	1130	Mean
62892	6600			Standard Error	684 3472	Standard Error
62892	80			Variance	80	Median
62992	80			Kurtosis	80	Mode
62992	80			Skewness	2164 096	Standard Deviation
				Range	4683311	Variance
				Minimum	4 866652	Kurtosis
				Maximum	2 279253	Skewness
				Sum	6520	Range
				Count	80	Minimum
				Confidence Level(0 950000)	6600	Maximum
					11300	Sum
					10	Count
					1341 296	Confidence Level(0 950000)
					2445 042	

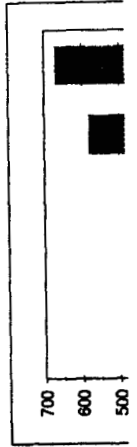
# PCB CONCENTRATION IN SEDIMENTS

POND B-3				POND E			
SED SITE	TOTAL PCB ALL SAMPLES	SED SITE	"TOTAL"PCB BY LOCATION	DETEC.PCB BY LOCATION	TOTAL PCB ALL SAMPLES	"TOTAL"PCB BY LOCATION	
63092	80	63092	160	0	727 1429	Mean	1136
63092	80	63192	350	270	259 5038	Standard Error	561 147
63192	270	63292	2390		175	Median	350
63192	80	63392	2620		80	Mode	160
63292	2700	63492	160		970 9744	Standard Deviation	1254 763
63292	620				942791 2	Variance	1574430
63292	870				1 517174	Kurtosis	-3 19975
63292	80				1 593399	Skewness	0 610608
63392	2900				2820	Range	2460
63392	860				80	Minimum	160
63392	1400				2900	Maximum	2620
63392	80				10180	Sum	5680
63492	80				14	Count	5
63492	80				508 6181	Confidence Level(0 950000)	1099 828

PCB CONCENTRATION IN SEDIMENTS

POND B-4

SED SITE	TOTAL PCB ALL SAMPLES	SED SITE	"TOTAL"PCB BY LOCATION	DETEC.PCB BY LOCATION
63592	230	63592	235	
63592	80	63692	160	
63592	80	63792	580	
63592	80	63892	670	
63692	80	63992	270	
63692	80			
63792	440		160	
63792	80		235	
63792	560		270	
63792	80		580	
63892	80		670	
63892	1100			
63892	80			
63892	80			
63992	300			
63992	80			



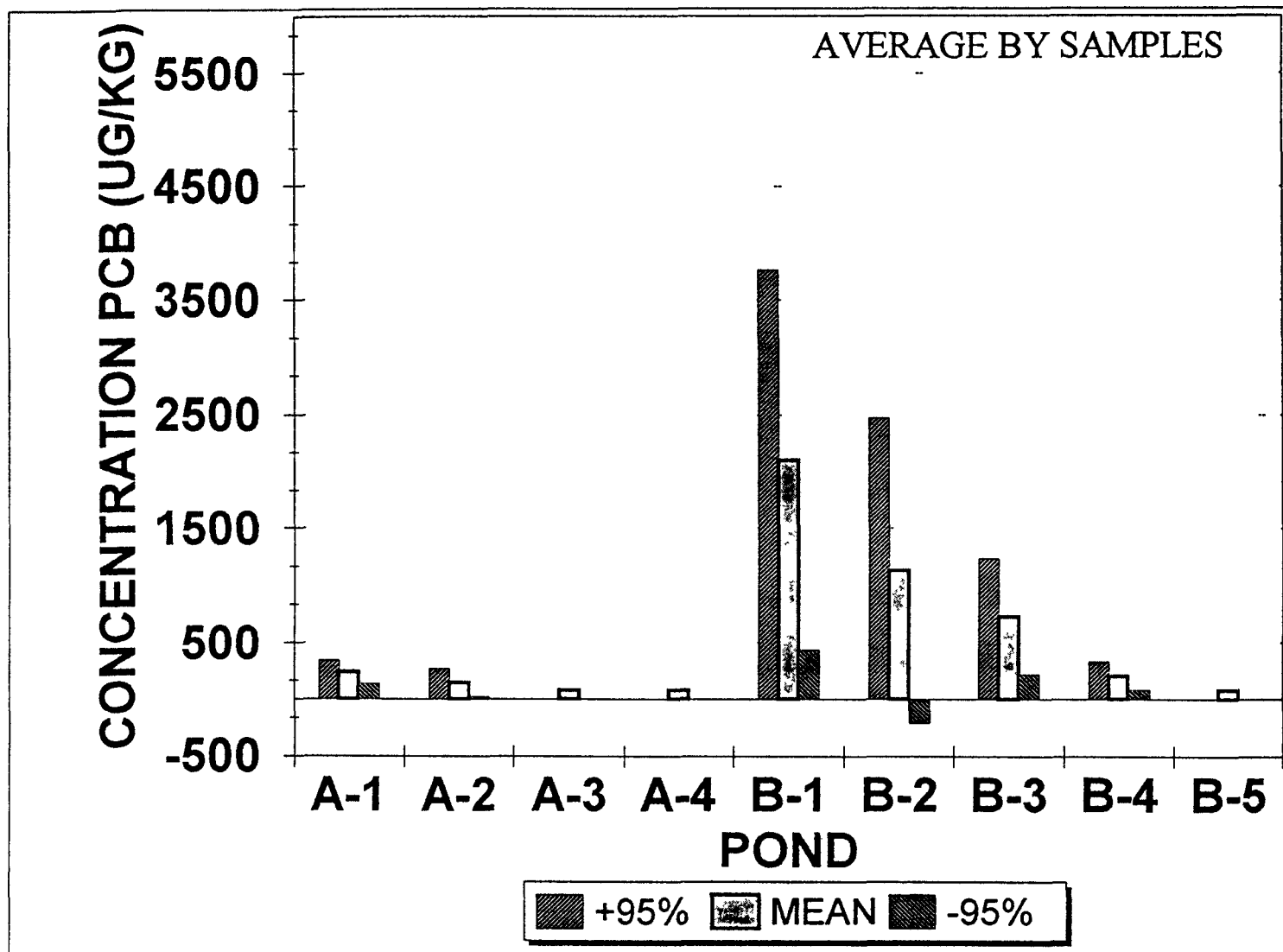
POND B-4

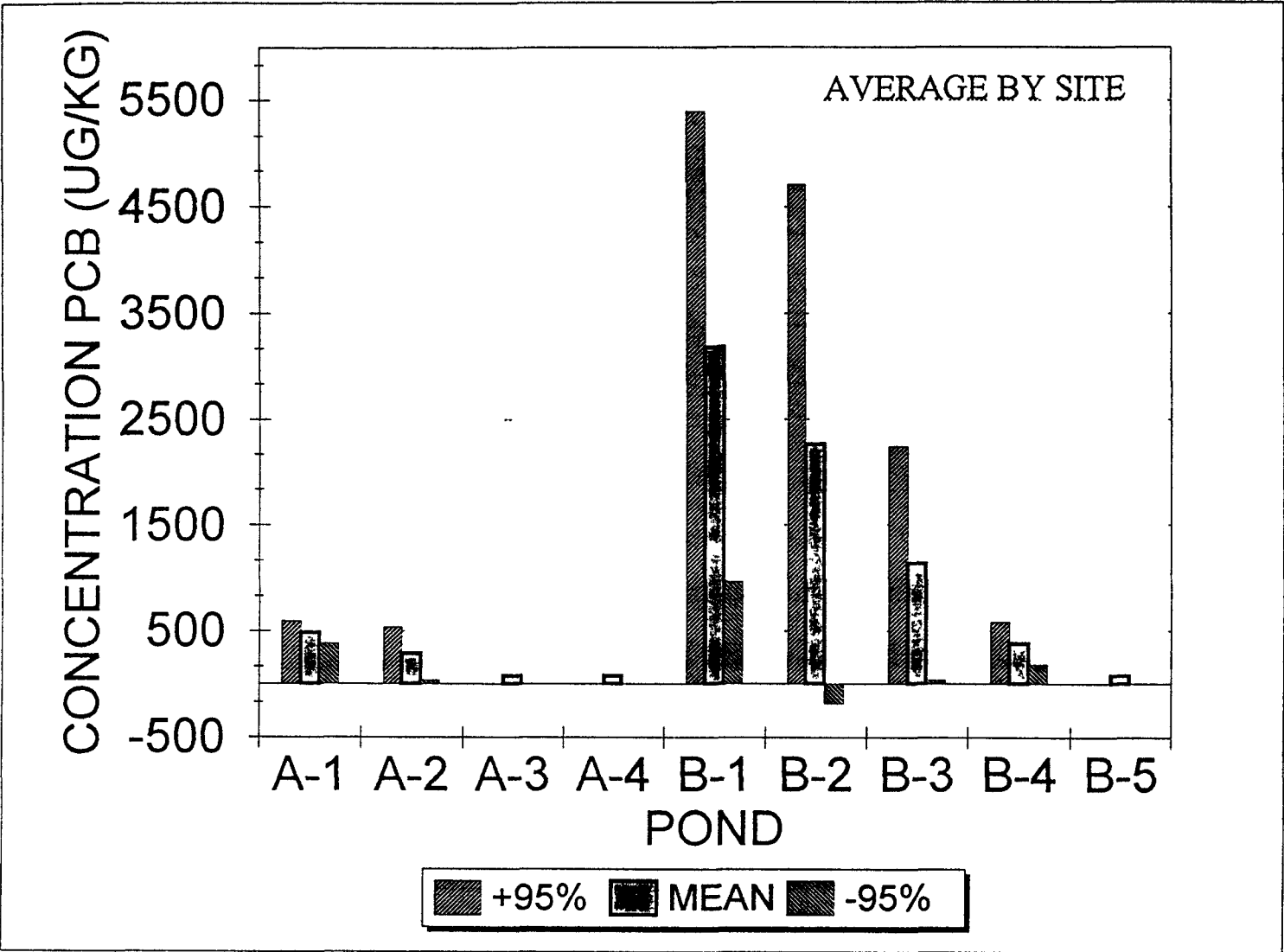
"TOTAL"PCB BY LOCATION	TOTAL PCB ALL SAMPLES	Column 1
Mean	203 8889	Mean 383
Standard Error	62 49256	Standard l 101 38540328864
Median	80	Median 270
Mode	80	Mode NA
Standard Deviation	265 1335	Standard l 226 70465367963
Variance	70295 75	Variance 51395
Kurtosis	7 704864	Kurtosis -2 602105933624
Skewness	2 677558	Skewness 0 55468677384101
Range	1020	Range 510
Minimum	80	Minimum 160
Maximum	1100	Maximum 670
Sum	3670	Sum 1915
Count	18	Count 5
Confidence Level(0 950000)	122 4832	Confidenc 198 71173981872

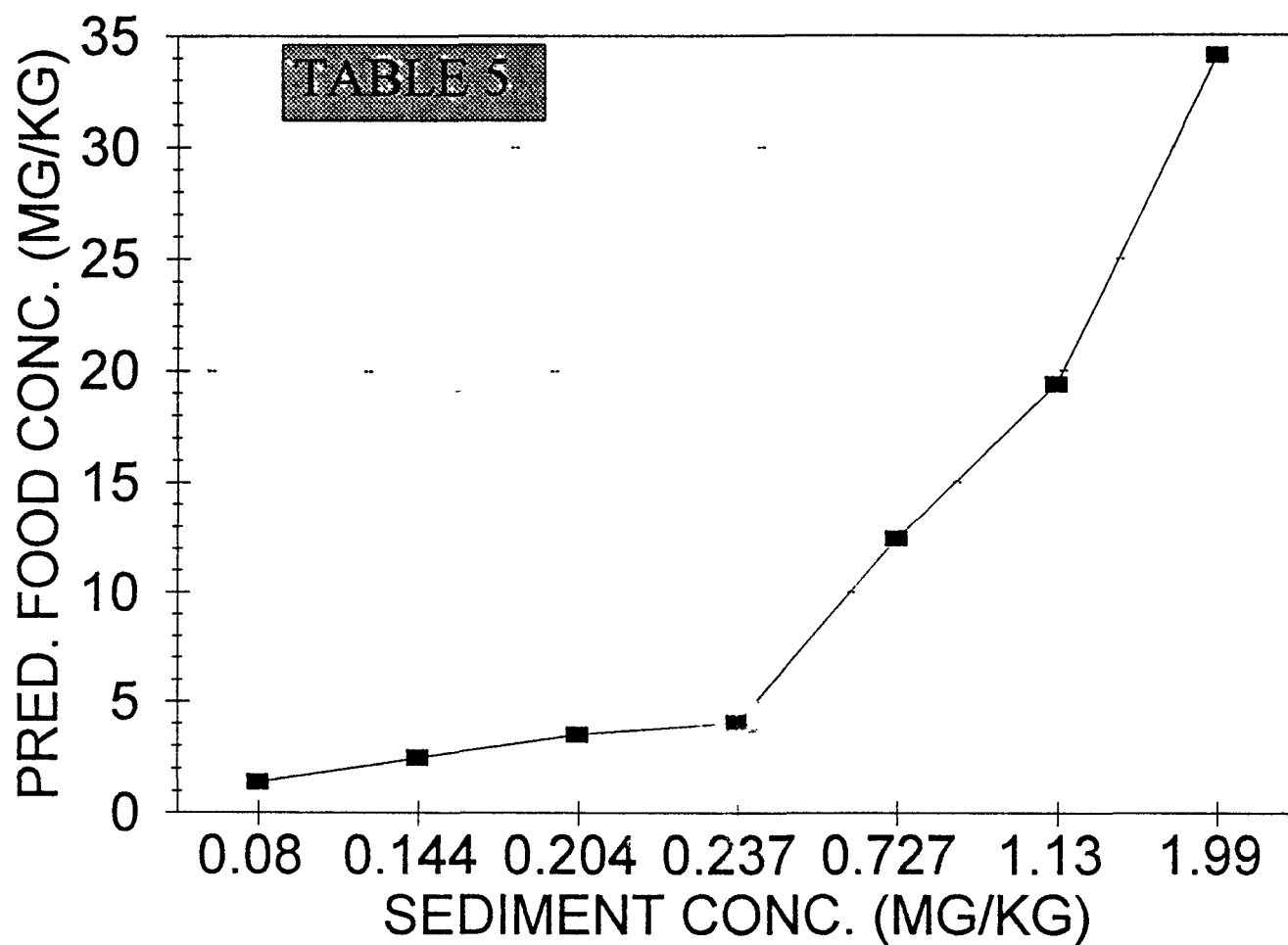
# PCB CONCENTRATION IN SEDIMENTS

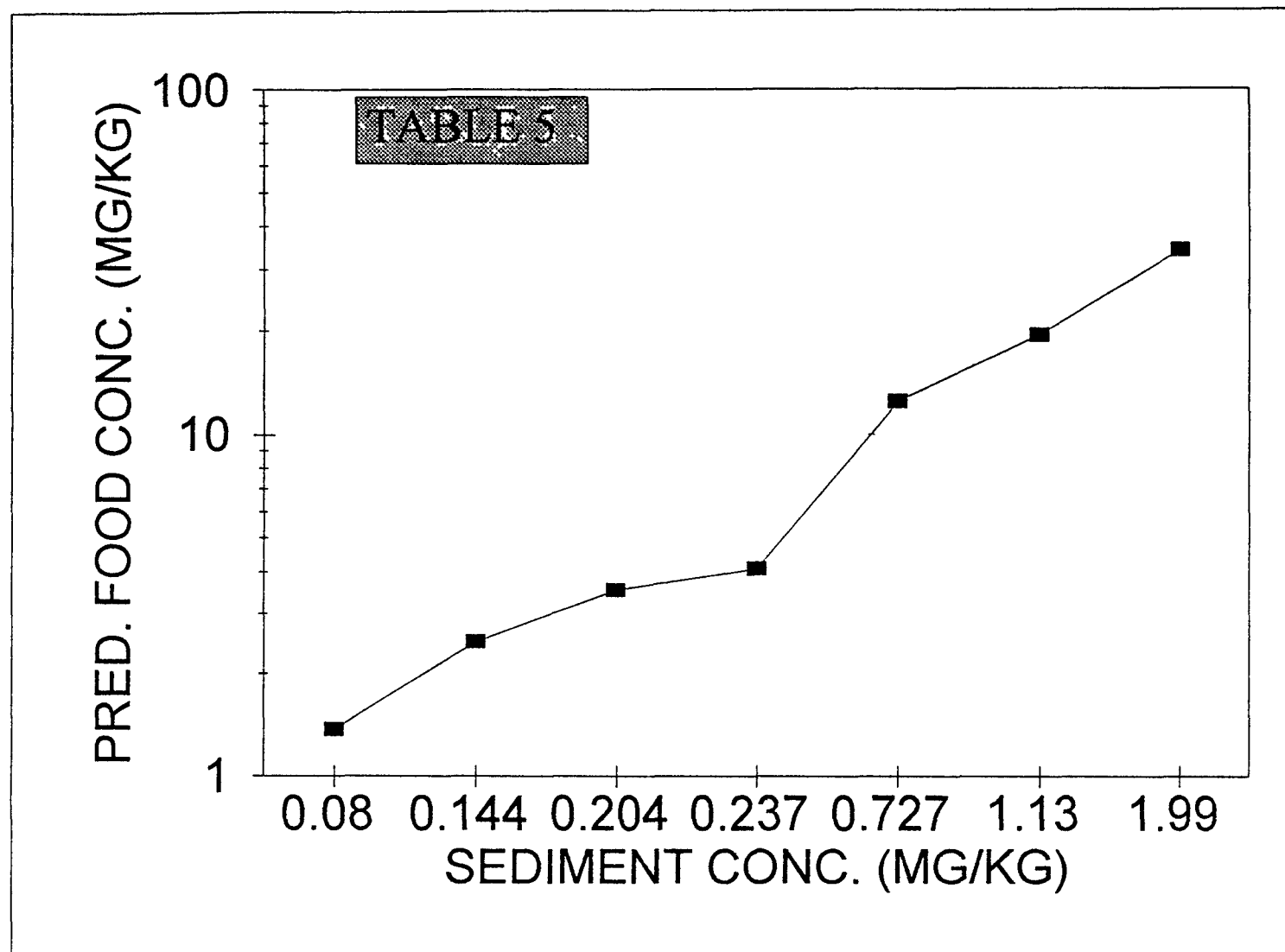
## STOLLER MEAN OF ALL SAMPLES

	MEAN	MEAN"+95%	MEAN	MEAN"-95%	95% C I
A-1	236 6667	338 43315356	236 6666667	134 9001798	101 7665
A-2	143 75	268 69770453	143 75	18 80229547	124 9477
A-3	80 A-3		80		
A-4	80 A-4		80		
B-1	2100 588	3764 0977796	2100 588235	437 078691	1663 51
B-2	1130 B-2	2471 2959004	1130	-211 2959	1341 296
B-3	727 1429 B-3	1235 7609875	727 1428571	218 5247268	508 6181
B-4	203 8889 B-4	326 37204814	203 8888889	81 40572964	122 4832
B-5	80 B-5		80		
EG+G					
MEAN OF SEDIMENT SITES					
A-1	486 A-1	589 45194228	486	382 5480577	103 4519
A-2	287 5 A-2	537 39540905	287 5	37 60459095	249 8954
A-3	80 A-3		80		
A-4	80 A-4		80		
B-1	3180 B-1	5392 7919695	3180	967 2080305	2212 792
B-2	2260 B-2	4705 0423154	2260	-185 042315	2445 042
B-3	1136 B-3	2235 8279921	1136	36 17200793	1099 828
B-4	383 B-4	581 71173982	383	184 2882602	198 7117
B-5	80 B-5		80		
		+95%	MEAN	-95%	

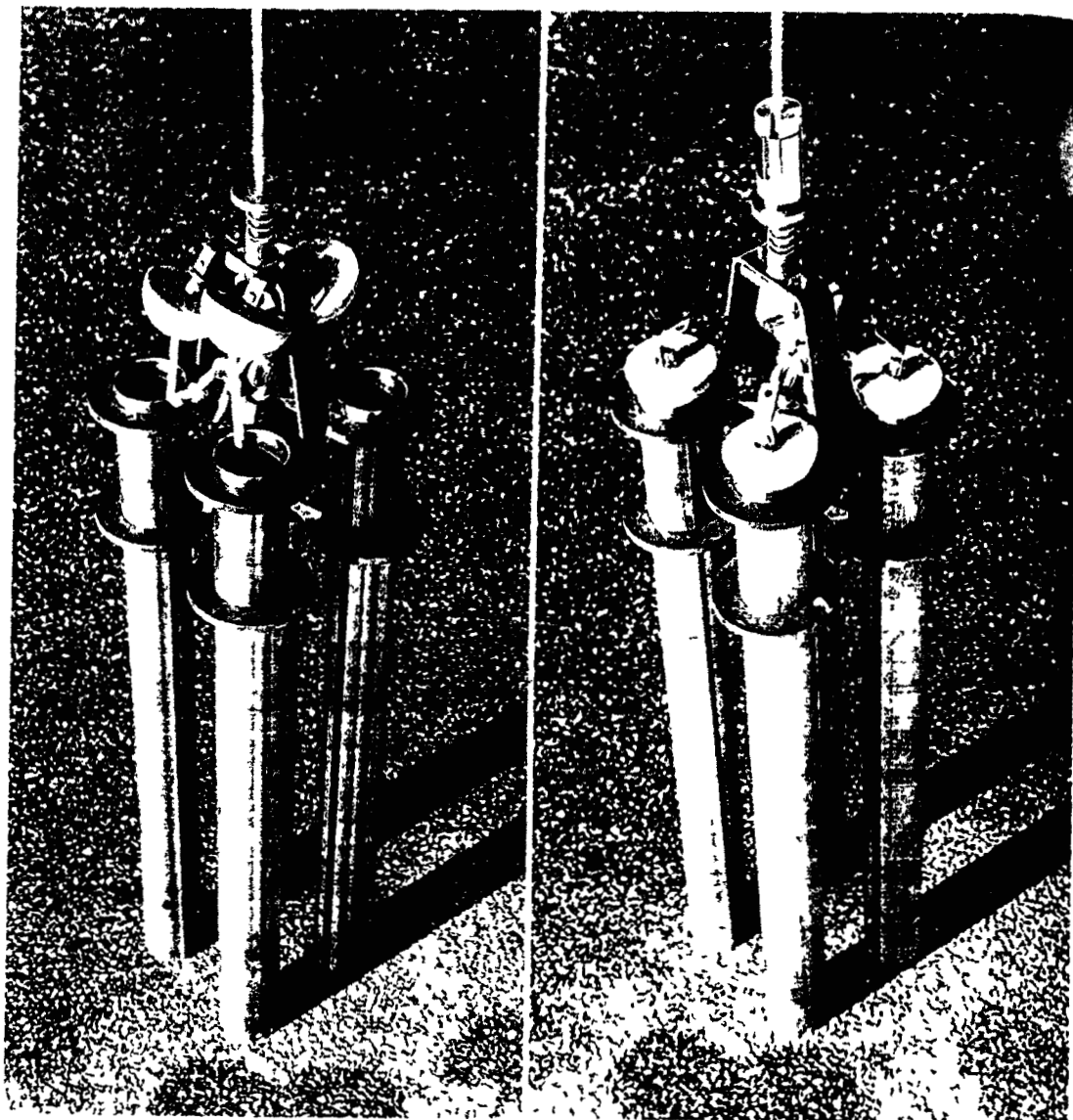












**Figure 12.3** A multiple corer with ball type closures that are released by a messenger after the tubes have penetrated into the sediments

- 5 It can be easily modified to perform experiments on benthic metabolism (e.g. with plastic core liners)
- 6 When the coring tubes are made of transparent plastic the sediment profile, including the sediment-water interface is readily available for visual inspection

Neither the Ekman grab nor the multiple corer will take totally quantitative samples in coarse gravel or organic debris [see Elliott and Drake (1981) for comparisons and recommendations]. The use of SCUBA may facilitate quantitative sampling under many circumstances.

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# PCB CONCENTRATION IN SEDIMENTS

MEDIA	A1	A2	A3	A4	B1	B2	B3	B4	B5	TOTAL
SEDIMENTS	10	10	10	10	10	10	10	10	10	90
FISH			5		5				5	20
BENTHOS	5		5	5	5	5	5	5	5	45
EMERG INSECTS	5	5	5	5	5	5	5	5	5	45
ZOOPLANKTON	5	5	5	5	5	5	5	5	5	45
ALGAE	5	5	5	5	5	5	5	5	5	45
MACROPHYTES	5	5	5	5	5	5	5	5	5	45
EGGS	5	5	5	5	5	5	5	5	5	45
WATER	5		5	5	5	5	5	5	5	45
										425 COST
										\$42,500

20210

# Stoller

19

established 1959

May 16, 1994  
2501-94/29

Mr Neil Holsteen  
Building 080  
EG&G Rocky Flats, Inc  
P O Box 464  
Golden, CO 80402-0464

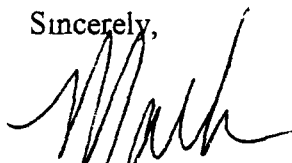
RE Responses to Comments on Addendum No 1 - Field Implementation Plan  
Operable Unit 6 Walnut Creek Priority Drainage

Dear Mr Holsteen

Enclosed please find one copy of the Revised Field Implementation Plan, Addendum No 1(FIP) The FIP has been revised to address comments from EG&G, dated May 12, 1994  
Written responses to comments are also enclosed

If you have any questions, please do not hesitate to contact me

Sincerely,



Mark Lewis, Ph D  
Project Manager, Area 5 MTS

Enclosure As Stated

cc	T Brady	EG&G
	N Holsteen	EG&G
	M Lewis	Stoller
	L Ross	Stoller, letter only
	Chron	ABC, letter only

# REVIEW COMMENT SHEET

Please review the attached procedure February 11, 1994 Addendum No 1, Additional Pond Sediment Investigations, OU 6  
 Comment Due Date May 12, 1994 Number Rev Draft

☐ Internal Review ☐ Parallel Review ☐ Verification ☐ Validation ☐ Revalidation

QA X Peer     

General (G) comments require resolution but do not require resolution acceptance Mandatory (M) comments require resolution and resolution acceptance  
 1-88000-PP-004 provides complete definitions of General and Mandatory comments

ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	All		Page headers are needed in this document		<i>CHH 5-11-94</i>
M	All		Page numbers are needed on the pages containing figures and tables		<i>CHH 5-11-94</i>
G	5	3 1 2	2 <sup>nd</sup> , first sentence The reference to "EG&G" should be deleted		<i>CHH 5-11-94</i>
M	5	3 1 2	2 <sup>nd</sup> , third sentence No indication or reference is given for determination of the detection limit or one-half of its' value These limits should be included		<i>CHH 5-11-94</i>
M	5	3 1 2	2 <sup>nd</sup> , fourth sentence This statement seems incorrect Use of one-half the detection limit for non-detects to determine the mean concentration results in a potential under-estimation of PCB concentrations in sediments		<i>CHH 5-11-94</i>

POC/Reviewer (Comments not signed by Reviewer/POC will be considered unofficial and not subject to resolution)  
☐ No Comments

☐ This procedure revision has no impact or relevance to our discipline or organization and we waive need to concur  
 We acknowledge this concurrence waiver does not affect our responsibility to implement the requirements of this procedure when needed

C H Hayes Name      Signature *CHH* Date 5-11-94  
 x6905 080/EP/Stiger Bldg./Dept /AGM  
 Ext./Pager/Fax     

Return to

FAX      Name N.A. Holsten Ext      Location     

If questions on content, please call the SME

Name      Ext     

NOTE These reviews will be completed by qualified reviewers in accordance with 1-88000-PP-004 in concert with 1-88000-PP-001 and 1-88000-PP-003

# REVIEW COMMENT SHEET (continued)

Page 2 of 4

Review comments for document Addendum No 1, Additional Pond Sediment Investigations, February 11, 1994

Number

Rev

Draft

ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	7	Figure 2	The title of the figure states the histograms show "Total PCB Concentrations", however, it seems that the histograms show mean concentrations of PCB's in the sediment. Correct as necessary.	see attached	OKA 5-19-94
M	8	Table 2	Based on the discussion of detection limits in the text (section 3.1.2) and interpretation of this table, the minimum detection limit is 32 mg/kg and one-half the detection limit is 16 mg/kg. However, two reported concentration values (SED63592 and SED63992) for Pond B 4 are below the minimum detection limit but not reported as 16 mg/kg. This needs clarification/explanation.		OKA 5-19-94
M	8	Table 2	The endnote for the Table states that duplicate samples were averaged with real samples. The duplicate sample numbers should be identified. Also, did the RPD values for the real and duplicated samples fall within the precision objectives? This is a key determination before using the duplicate sample results in the sample set to determine the mean concentration for the site.		OKA 5-19-94
G	18	3.3	last ¶, third sentence "standard EPA sediment- and water toxicity tests" should be parenthetically referenced.		OKA 5-19-94
G	20	4.2	first ¶, fourth sentence Justification for not utilizing a TIE would further support this statement.		OKA 5-19-94
M	20	4.2	second ¶ The discussion of significant toxicity to <i>Hyalalella azteca</i> in Pond B-2 is discussed according to the results presented in Table 1. Based on information presented in Table 1, why is there no discussion of the apparent significant toxicity to <i>H. azteca</i> in Pond B 5 where only a 60% survival rate is indicated?		OKA 5-19-94
			Typographical discrepancy " <i>Hyalalella</i> " is spelled two different ways ( <i>Hyalalella/hyalalella</i> ) in the text of this paragraph and in Table 1. Edit accordingly.		OKA 5-19-94
G	27	Table 6	The column entitled "Date to be Collected" needs to be updated to reflect the latest schedule for sampling. Also, the calendar year of the sampling should be identified.		OKA 5-19-94

POC/Reviewer (Comments not signed by the Reviewer/POC will be considered as unofficial comments)

Resolutions Accepted

C H Hayes  
Name

Signature

Date

5-11-94

Initials

Date

5-19-94

# REVIEW COMMENT SHEET (continued)

Page 3 of 8

Review comments for document				Rev	Draft
Addendum No 1, Additional Pond Sediment Investigations, February 11, 1994					
ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	25	5 1	first ¶ The definition and description of the DQO process are incomplete. Consider using the following text to further define and describe the process - Data Quality Objectives are qualitative and quantitative statements that define data quality criteria and sampling design performance specifications. DQO's clarify the study objective, define the most appropriate type of data to collect, determine the most appropriate conditions from which to collect the data, and specify acceptable levels of precision error to be used as the basis for establishing the quantity and quality of data needed to support the decisions. The DQO process has seven basic steps: 1) State the Problem, 2) Identify the Decision, 3) Identify Inputs to the Decision, 4) Define the Study Boundaries, 5) Develop a Decision Rule, 6) Specify Limits on Decision Errors, 7) Optimize the Design for Obtaining Data. (EPA 1993 Data Quality Objectives Process for Superfund U.S. Environmental Protection Agency EPA 540-R-93-071 Publication No 9355 9-01 August)	see attached	OK 5.19.94
G	26	5 2 1	third ¶, second sentence The phrase " of each type " needs clarification. What does "each type" refer to?		OK 5.19.94
M	un- versal		The references for the operating procedures (SOPs) should not contain the acronym "EMAD". All references need to be corrected to reflect the appropriate document, including the footnotes on Table 6 and the reference section.		OK 5.19.94
G	29	5 2 2	third ¶, third sentence Use of the word "minimum" connotes an absolute number. Is the minimum four or is it five? Definitizing the minimum number now will help later when PARCC parameters are evaluated after the work is completed.		OK 5.19.94
M	29	5 2 2	Text in the first paragraph of this section and in the first bullet provide considerable justification for refuting "direct comparison of results with previous work" as proposed in this page's last paragraph. The comparability of analytical results from different depths is not "direct" and should be reasonably interpreted.		OK 5.19.94
M	29	5 2 2	The description of the proposed sample locations in the seventh sentence of the last paragraph seem to contradict the third sentence of the same paragraph which states the samples will be taken " at the same general locations used in the previous sampling plan ". Figure 1 depicts the historical sampling locations and they do not appear to be in the same general location as the proposed locations.		OK 5.19.94
G	30	5 2 3 1	first ¶, last sentence " will be frozen within six hours " needs clarification. This statement could be improved and the ambiguity removed if it is revised to state within six hours of what? (collection, etc.)		OK 5.19.94

C. H. Hayes

Fluoride

5-11-94

Charles Hayes

## REVIEW COMMENT SHEET (continued)

[illegible]

RESPONSES TO COMMENTS  
FIELD IMPLEMENTATION PLAN  
ADDENDUM NO 1  
OPERABLE UNIT NO 6

Page 1

Comment 1

Response Page headers were added to the text and figures in the document

Comment 2

Response Page numbers were added to figures and tables, including maps

Comment 3

Response The text was altered to read During the RFI/RI, sediments were collected from multiple locations within each pond and analyzed for several PCB congeners

Comment 4

Response The text was altered to read However, samples in which PCBs were not detected were included in the calculation of mean concentrations by assigning concentrations equal to one-half the contract required detection limit (CRDL) (DOE 1993b, EPA 1989)

Comment 5

Response The text was altered to read. Therefore, the mean concentrations presented here may overestimate or underestimate the PCB concentrations in sediments

Page 2

Comment 1



Response The title of Figure 2 was changed to read OU6 Phase I RFI/RI Average of Total PCB Concentrations in Sediments of A- and B-Series Ponds

Comment 2

Response The following text was added PCB data are the sum of Aroclor-1254 and Aroclor-1260, each with a detection limit of 0.160 µg/kg Results below detection limit are the sum of one nondetect PCB sample at one-half detection limit and one PCB sample above the detection limit

Comment 3

Response Duplicate samples are in Attachment 2

The text was altered to read The preliminary data in Table 2 and Figure 2 are composites over the top two foot interval It is theorized that PCBs may be present in discrete lenses or patches within the sediments If this is true, and compositing does not equally represent the lenses, wide variation between duplicate and real results can be expected The RPD (relative percent difference) specified in the QAA for OU6 was ignored when averaging duplicate and real samples as a result of to the nature of contamination postulated and the very preliminary nature of the data

Comment 4

Response The following references were added to the text and references ASTM 1990, ASTM 1993a, ASTM 1993b, ASTM 1993c

Comment 5

Response The text was altered to read It should be noted that indication of significant toxicity was not always followed by a Toxicity Identification Evaluation (TIE) to determine the source of toxicity as previous tests indicated unionized ammonia as toxic (EG&G 1993)

Comment 6

Response The following footnote was added 89% of controls survived, so results were not significantly different

*Hyalella* is the correct spelling and has been corrected appropriately in the text and tables

Comment 7

Response The column in Table 6 entitled "Date to be Collected" was updated to reflect the most current schedule, with sampling dates between May and July, 1994

Page 3

Comment 1

Response The following text was added DQO's clarify the study objective, define the most appropriate type of data to collect, determine the most appropriate conditions from which to collect the data, and specify acceptable levels of precision error to be used as the basis for establishing the quantity and quality of data needed to support the decisions The DQO process has seven basic steps 1) state the problem, 2) identify the decision, 3) identify inputs to the decision, 4) define the study boundaries, 5) develop a decision rule, 6) specify limits on decision errors, and 7) optimize the design for obtaining data The OU6 Work Plan QAA and PARCC parameters will be followed for this addendum (DOE 1992b)

Comment 2

Response The text was altered to read The initial objective is to collect samples as outlined in Table 6

Comment 3

Response The references to EMAD in citations for SOPs were deleted The references were verified for the correct document

Comment 4

Response The text was altered to read A minimum of five samples will be taken per pond at the same general locations used in the previous sampling plan.

Comment 5

Response The text was altered to read Comparison of collocated results with previous work will assist in determining depth and bioavailability of PCBs

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Comment 6

Response -The text was altered to read Approximate sample locations will be one each at the inlet, maximum depth, and three other sites

Comment 7

Response The text was altered to read All tissue samples will be frozen within six hours of collection

Page 4

Comment 1

Response These pages are part of the OU6 Phase I RFI/RI Work Plan which includes filed and trip blank frequency and is approved However, they have been incorporated by reference

Comment 2

Response The OU6 Work Plan QAA has been incorporated by reference as well as the PARCC parameters for the original FSP

**INTEROFFICE CORRESPONDENCE**

DATE February 18, 1994

TO N A Holsteen, Environmental Remediation, Bldg 080, X6987

FROM  F A Vertucci, Ecology and National Environmental Policy Act Division, X3427SUBJECT REVIEW OF DRAFT OF ADDENDUM NO 1 ADDITIONAL POND SEDIMENT  
INVESTIGATIONS - FAV-113-94

I have read and reviewed the Draft of "Addendum No 1 Additional Pond Sediment Investigations" prepared by Dr Mark Lewis of Stoller Corporation. The first set of our comments on the earlier draft have been satisfactorily addressed in this latest draft dated February 11, 1994. I have pointed out some minor typographic errors in this latest draft to Dr Lewis. I concur with the general approach to additional pond sediment sampling and the sampling of the pond biota associated with PCB contamination outlined in the document. In my view, with these data, a defensible risk assessment can be generated describing the influence of PCB's in OU6 ecosystems. The idea we discussed of taking additional samples for rad analysis while sampling for PCB's is clearly worth doing. I will include this in the Scope of Work.

I will begin to formulate the technical sections of a Statement of Work to accomplish the necessary additional field sampling. I hope we will be able to have a meeting with the appropriate regulators and our DOE counter parts so Dr Lewis can present his strategy for the OU6 EE. I can modify the draft SOW to comply with the comments of DOE and the Regulators. I should have a draft of the SOW for your use by March 4, 1994. Please advise me as to when we can meet with the Regulators. Recall that I am unfortunately tied up in 40 hour OSHA training all next. I hope the meeting can be as soon as possible after my training.

Please let me know how I may be of further assistance.

FAV mad

Attachment  
As Stated

F A Harrington  
E C Mast  
S M Nesta  
File

February 11, 1994  
2501-94/08

Mr Ed Mast, Project Manager  
Building 80  
EG&G Rocky Flats, Inc  
P O Box 464  
Golden, CO 80402-0464

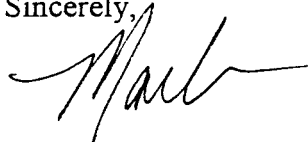
RE Addendum to OU6 EE Sampling and Analysis Plan

Dear Mr Mast

A copy of the revised "Phase I RFI/RI Environmental Evaluation Field Implementation Plan—Addendum No 1" is enclosed. The document summarizes preliminary information on the ecological risk due to polychlorinated biphenyls in the sediments of the A- and B-Series ponds. We have not yet received information from the laboratory regarding the minimum amount of tissue required for PCB analysis or the lowest possible PCB detection limit. The appropriate federal and state permits will be necessary to conduct the proposed egg sampling. The document also describes ecological sampling that may be required to adequately address ecological risks in the Phase I RFI/RI Report.

Please review and comment on the document at your earliest convenience. If you have any questions or comments, please do not hesitate to call.

Sincerely,



Mark C. Lewis, Ph.D.  
Project Manager

Enclosure

cc	T Brady	EG&G w/o enclosure
	F Harrington	EG&G w/o enclosure
	N Holsteen	EG&G
	F Vertucci	EG&G
	A Crockett	Stoller w/o enclosure
	L Ross	Stoller w/o enclosure
	M Turnbull	Stoller w/o enclosure
	MCL	Chron, w/o enclosure

50102\lmast01.doc



- Fig 3 Should be redrawn with proper means and confidence intervals I have provided an example Given the sample variability the trend in concentrations from upstream to downstream is not as clear cut We know nothing about the variability in the below detection limit ponds Considering that ponds with significant PCB levels also, at some sample locations, find no detectable PCB one wonders if the systems were sampled well enough to conclude there is no PCB in the terminal A and B series ponds I strongly believe that more intensive sampling of sediment PCBs is required
- Table 3 The origin of these data and the calculation of the endpoints listed should be described "Dominant Taxon" versus "Taxa Richness" Define taxon and taxa used Dominant Family row lists the Class Oligochaeta
- Page 14 Paragraph on fish is not parallel construction and logic with paragraph on herptiles One refers to pond systems the latter references the whole watershed. Are there data for herptile occurrence for each pond?
- Page 15 I have a reference for bioconcentration by Pimphales minnows of 274,000x which is greater than the  $10^5$  listed in the Eisler, 1986 reference Pimphales makes a good candidate for PCB monitoring in those ponds where it is present
- Fig 4 A box for zooplankton, bacteria, and detritus could be added to make this figure more accurate
- Page 17 Table 3 is cited as containing information on mollusks and no data are presented for mollusks in Table 3 The benthos data could be better reported than by those endpoints listed in Table 3
- Top consumer could be predatory raptors!
- Table 4 Receptors could also include bass, minnows and raptors
- Figure 5 I think zooplankton should be added to each exposure pathway
- Page 24 Where did the organic carbon data come from? Each site, one site? Sample depth? What is the variability in sediment organic content and how does that affect the calculation of SQC values? If we have site specific data on sediment % organic content it should be used How are the SQC values calculated? Show numbers and formula Note the discrepancy between listing 19.5 ugPCB/g total organic carbon on one paragraph followed by 19.5 ugPCB/kg sediment in the next This is confusing and not reported well

- Page 25      Top paragraph    assumption may overestimate exposure and "underestimate" the level of PCBs    Shouldn't that be overestimate levels of PCBs?
- Sec 4 2      The section describing the sediment and water toxicity testing does not stand alone    Where are the data? What test design? How many replicates? etc etc    In my view the toxicity testing done by the SWD is not scientifically sound due to lack of replication    B-2 was sampled in 1991 for benthos and 1993 for sediments    Given the importance of this EE for this OU these data should be derived during the same season and year otherwise interpretation is clouded at best    The toxicology test data suggest that pond B-5 water is significantly toxic to *Ceriodaphnia sp* yet this year I collected *C. reticulata* from pond B-5 with 40 individuals per liter of water
- Section 4 3    I can't use the formula since all the data are not presented    How is the concentration in food determined from the sediment concentration of PCB?    I have graphed the relationship between the sediment conc and predicted conc in food and don't see a clear relationship
- Define the assumptions with the rational for all model parameters (ie lognormal distribution)    What is the sensitivity of the model parameters?    Can you do a sensitivity analysis?
- Table 5      This analysis will need to be redone with the proper sediment chemistry concentrations
- Page 25      Last paragraph *H. asteca*    Table 3 not 2

20 Jan 94

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To Ed Mast, OU6 Manager  
From Bruce Bevirt, EE Technical Lead  
Topic Comments on the Draft RFI/RI EE SAP/FSP Addendum No 1

The following are the END comments on the SAP/FSP Addendum

- 1) p 1 There are 10 not 11 ponds in OU6
- 2) Figure 1 It is difficult to tell which sediment sampling location numbers correspond to which location dots in the B-series ponds
- 3) Table 1 This table has a number of problems including, headings with no information, water level is managed on all ponds through discharge or spray irrigation, the A-4 "Water Source" should include C-2 and B-5, and the Hyallela toxicity test results may be confusing (wasn't 60% survival in B-5 significantly more toxic than controls?)
- 4) p 7 In first paragraph, mean concentration may actually be underestimates if >80 ug/kg and <160 ug/kg
- 5) p 7 In third paragraph, ponds A-3, A-4, and A-5 are partially drained and refilled
- 6) p 7 Last full sentence, doesn't Table 3 indicate B-3 is amongst the "richest" also?
- 7) Table 3 How were the "Taxa Richness" numbers calculated
- 8) p 14 In first full paragraph, what other ponds in the drainage (isn't W and I the only one) and which species were there?
- 9) p 14 We could probably add sampling of mallard eggs as it appears that a resident population exists in the B-series. Consider the following information, Mallard broods were reported on the A and B-series ponds during the Wildlife Baseline Study in 1991 (DOE, 1992), and have been observed each year since (Fred A Harrington, pers comm)  
A pair of Canada geese established a nest a few meters from pond B-3 in the spring of 1991. However, the nest failed due to predation, presumably from raccoons. Another pair successfully nested in the Woman Creek drainage during the same period. In May they walked their brood of three to the B-series ponds and then to the A-series where they successfully fledged in August (Harrington, pers comm)
- 10) p 14 Third full paragraph, mule deer definitely use Walnut Crk drainage (not probably)
- 11) Figure 4 Might we include another trophic level higher with raptors and/or coyotes? What about waterfowl eggs?
- 12) p 17 First paragraph, herbivorous is misspelled

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- 13) Table 4 Direct Effects to raccoons may include exposure from ingestion of waterfowl eggs, fish, etc
- 14) p 21 Under Direct Effects again, observations suggest that individual mallards are year-round residents in the vicinity of B-1 to B-3. A search could be made for mallard eggs simply by observing their movements to and from the nests during the nesting season this spring. Eggs taken for analysis would be representative of local food web conditions and the data would be attributable to sources in the A and B-series. We'll have to check into collection of these under our Federal Permit.
- 15) Figure 5 Again, we could add other trophic levels and pathways (e.g. waterfowl eggs)
- 16) p 27 Last paragraph, why use one-half the detection limit? Explain
- 17) p 31 Last paragraph why refer to Table 5 here?
- 18) p 33 Second paragraph change "and" to "an"
- 19) Attachment 1 There may be other concerns about the statistical analyses

Thanx